RESEARCH DEPARTMENT

LOW POWER TELEVISION TRANSMITTERS — ROSEMARKIE

Report No. K-113

(1956/19)

THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION

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SUMMARY

This report gives the results of tests at the site selected for a television transmitter at Rosemarkie, near Inverness. It is shown that a low power transmitter at Rosemarkie will provide most of the population in the Dornoch and Moray Firth areas with a satisfactory television service.

Reception tests show that the Meldrum television transmission should provide a satisfactory signal for rebroadcast reception (R.B.R.) at Rosemarkie.

1. INTRODUCTION.

The television distribution plan provides for a low power television transmitter to serve the Dornoch and Moray Firth areas of north-east Scotland.

The Rosemarkie site, 12 miles (19 km) north-east of Inverness was chosen for the following reasons:

i. The site is in the centre of the area to be served.

ii. Although 12 miles from the largest centre of population, Inverness, the profile between the site and Inverness is extremely good.

iii. The profile between the site and Meldrum is favourable for R.B.R. purposes.

It is proposed to use a 0·5 kW transmitter driving a two-tier batwing-V aerial elevated 256 ft (78 m) above ground level on Channel 2 (51·75 Mc/s). The mean e.r.p. will be 0·83 kW.

2. GENERAL.

The tests followed the usual site test procedure. When the weather permitted the test signal was radiated by a balloon-borne aerial flown at a height of approximately 250 ft (76 m). During periods of bad weather radiation was from a dipole mounted 110 ft (33 m) above ground level on a mast.

Both test transmission aerials were omnidirectional but all field strengths quoted have been corrected to correspond to a mean e.r.p. of 0·83 kW radiated by a

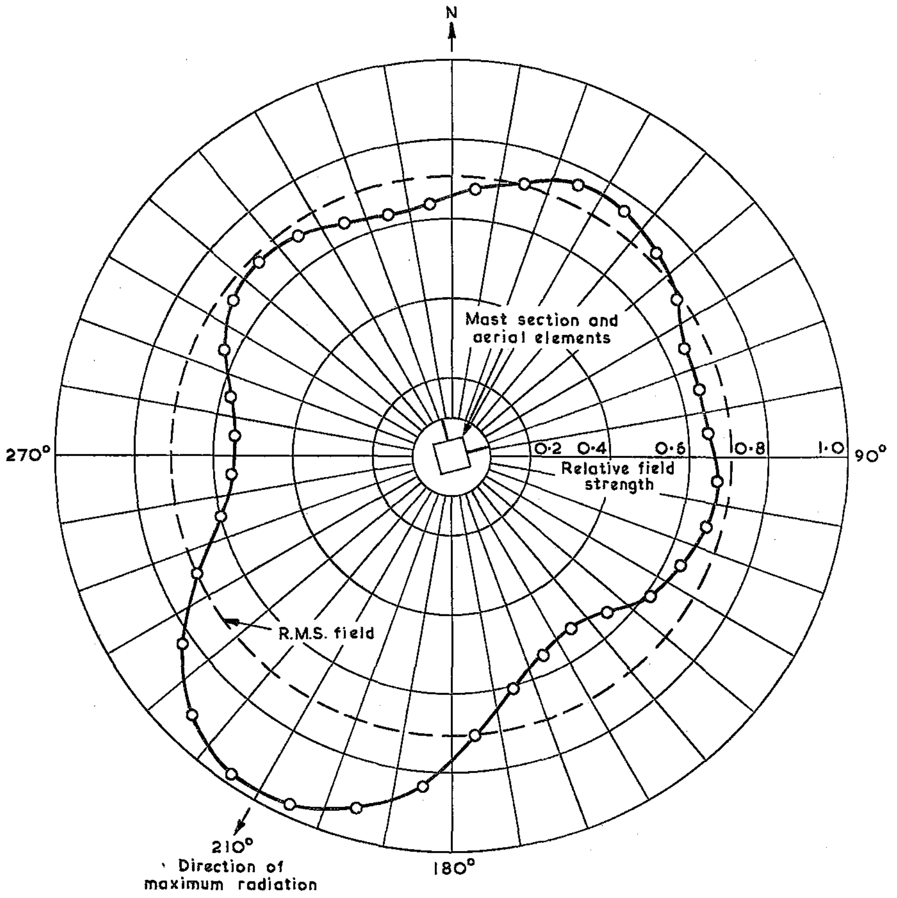

Fig. 1 - H.R.P. of the two-tier batwing-V aerial (Channel 2)

Channel 2 batwing-V aerial with maximum radiation on the bearing 210° E of N. The horizontal radiation pattern of the two-tier batwing-V aerial is shown in Fig. 1.

All field strength measurements were made with a receiving aerial mounted 15 ft (4·6 m) above ground level but they have been corrected, on a linear height-gain basis, to that for an aerial 30 ft (9·2 m) above ground level.

The observations on the strength and the reliability of the Meldrum transmissions were made with the receiving aerial 30 ft (9·2 m) above ground level and a calibrated Hallicrafter receiver. Picture quality was checked on a commercial television receiver.

Site data are given in the Appendix.

3. RESULTS.

The results of the site test are presented in a field strength contour map (Fig. 2) while the maximum, median and minimum field strengths in the more important towns are given in Table 1.

T314

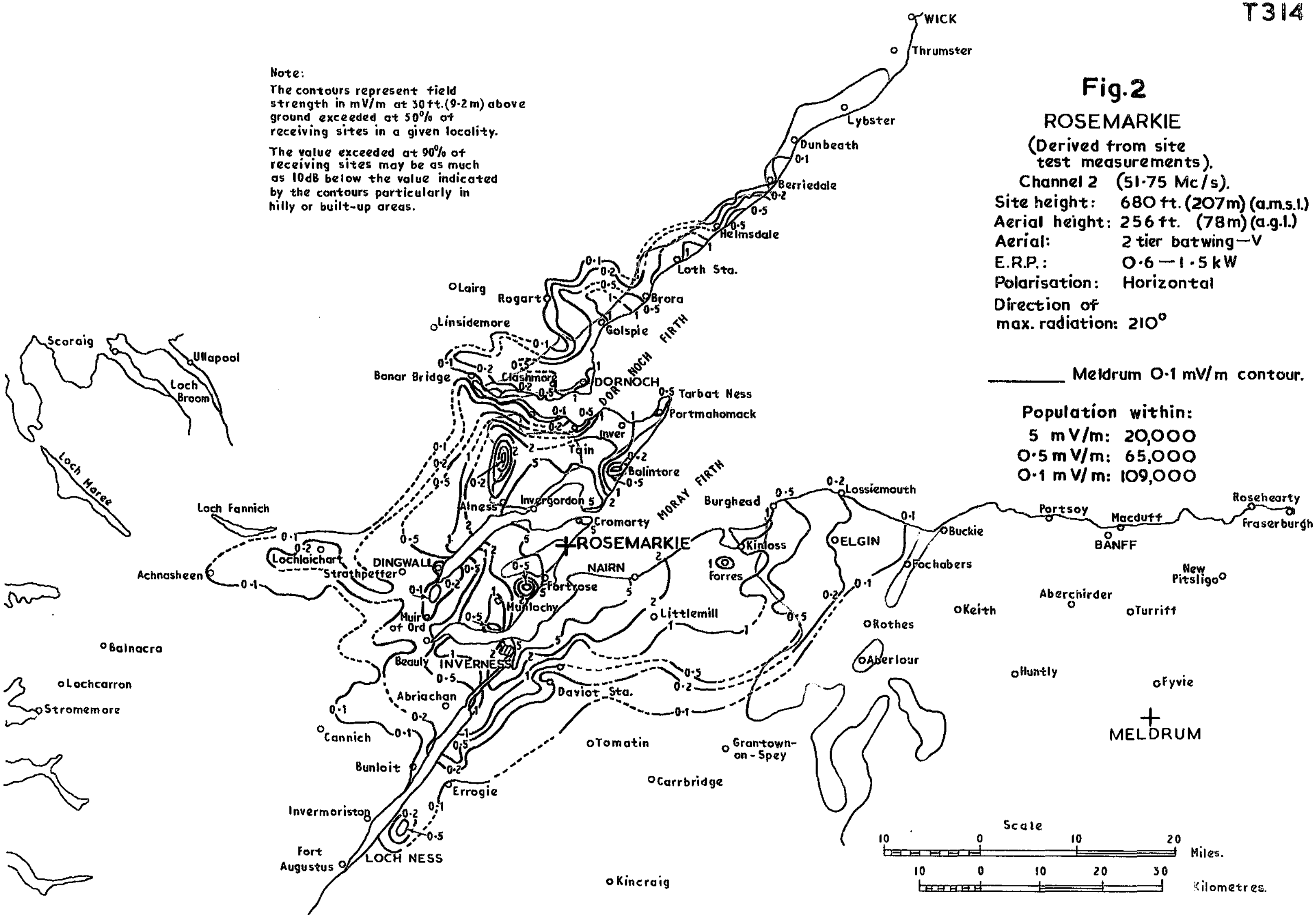

Fig.2

ROSEMARKIE

(Derived from site test measurements).

Channel 2 (51·75 Mc/s).

Site height:	680 ft. (207m) (a.m.s.l.)
Aerial height:	256 ft. (78m) (a.g.l.)
Aerial:	2 tier batwing—V
E.R.P.:	0·6 — 1·5 kW
Polarisation:	Horizontal
Direction of max. radiation:	210°

———— Meldrum 0·1 mV/m contour.

Population within:

5 mV/m:	20,000
0·5 mV/m:	65,000
0·1 mV/m:	109,000

Note:

The contours represent field strength in mV/m at 30 ft. (9·2 m) above ground exceeded at 50% of receiving sites in a given locality.

The value exceeded at 90% of receiving sites may be as much as 10dB below the value indicated by the contours particularly in hilly or built-up areas.

TABLE 1

Field Strength (mV/m) 30 ft (9·2 m) a.g.l.
for a 2-tier batwing-V aerial 256 ft (78 m) a.g.l.

E.R.P. = 0·6–1·5 kW

Direction of maximum radiation – 210°

Town	Max.	Median	Min.
Alness	9·9	4·9	2·5
Beauly	0·67	0·38	0·16
Bonar Bridge	0·16	0·06	0·03
Brora	0·79	0·25	0·1
Buckie	0·42	0·07	0·03
Burghead	1·5	0·9	0·58
Cromarty	8·2	5·0	0·82
Dingwall	0·45	0·19	0·07
Dornoch	2·2	0·9	0·35
Elgin	0·34	0·1	0·02
Forres	1·6	0·8	0·25
Golspie	1·5	0·8	0·46
Grantown-on-Spey	0·01	<0·01	<0·01
Helmsdale	0·41	0·16	0·06
Invergordon	53	12	5·3
Inverness	9·4	2·2	0·34
Lossiemouth	0·52	0·19	0·1
Nairn	7·0	3·7	1·0
Strathpeffer	0·48	0·21	0·09
Tain	1·5	0·38	0·15

From Fig. 2 (map T.314) it will be seen that Nairnshire and the western half of Morayshire are served by Rosemarkie, while the remainder of Morayshire is served by Meldrum. Inverness, with a median field strength of 2 mV/m, will have a very good service, and, with few exceptions, the entire population on the east coast of Invernessshire, Ross and Cromarty, and Sutherland will be within the service area of Rosemarkie. None of the towns in the Grampian Mountains, e.g., Grantown-on-Spey, Carrbridge, etc., will get a satisfactory service from Rosemarkie or from Meldrum.

Table 2, prepared by Engineering Information Department, shows the estimated population within the 5·0, 0·5 and 0·1 mV/m contours:

TABLE 2

Field Strength mV/m	Population
5·0	20 000
0·5	65 000
0·1	109 000

4. RECEPTION OF MELDRUM TELEVISION TRANSMITTER AT ROSEMARKIE.

As it is proposed to use the Meldrum television transmission for R.B.R. purposes, the field strength of Meldrum was recorded and the picture quality checked on a commercial television receiver. The receiving aerial height was 30 ft (9·2 m) and the total valid recording time 32 hours.

The median field strength 30 ft (9·2 m) above ground level for this period was 0·43 mV/m while the maximum and minimum values recorded were 1·0 mV/m and 0·2 mV/m respectively. For an aerial at a greater height a large increase in field strength cannot be expected because the site is virtually on the edge of a 680 ft (207 m) cliff. It is reasonable to suppose, however, that a height gain of 3 dB may be achieved, in which case the median field strength, based on the 32 hour test period, would be 0·6 mV/m. No interference was observed and, at all times, the picture quality was good.

5. CONCLUSIONS.

A 0·5 kW transmitter sited at Rosemarkie will provide a good service to almost the entire population in the Dornoch and Moray Firth areas. Short-term reception tests indicated that a fairly good R.B.R. television service will be provided by Meldrum.

APPENDIX

Site Height:	680 ft (207 m) AMSL
Latitude:	57° 38' 00" N
Longitude:	04° 04' 34" W
National Grid Reference:	28(NH)/76196225

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